Dynamic Damage Modeling for IRAC Simulations, Phase I



Completed Technology Project (2007 - 2007)

Project Introduction

NASA's Integrated Resilient Aircraft Control (IRAC) Project, Preliminary Technical Plan Summary identifies several causal and contributing factors that can lead to loss of aircraft control. Among these are adverse conditions and uncommanded motions which may be the result of vehicle or propulsion system failures or damage. One possible source of projectile damage is uncontained engine debris. This proposal focuses on development of a robust methodology for predicting the damage to aircraft structures from uncontained engine debris. The two objectives of this phase of the work proposed are: 1. Development of rigorous criteria and methodology for determining projectile sizes, shapes, velocities, and weights resulting from uncontained engine debris. 2. Research and development of techniques to predict realistic damage sizes and shapes resulting from projectile impacts on aircraft structure. The Phase I SBIR is intended to be a proof of concept and demonstration of the feasibility of interfacing UEDDAM with LSDYNA. One of the main products of the effort will be to well prepared plan for proceeding to Phase II. Whereas the Phase I product will be a proof of concept, it will not be ready for commercialization. It will be a prototype that does not have the user-friendly features such as graphical user interface (GUI). Nor will it have the ability to account for composite materials in the target. Thus the Phase II effort will focus on these two issues.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer



Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Туре	Location
★Langley Research	Lead	NASA	Hampton,
Center(LaRC)	Organization	Center	Virginia
RHAMM Technologies,	Supporting	Industry	Bellbrook,
LLC	Organization		Ohio

Primary U.S. Work Locations	
Ohio	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX10 Autonomous Systems
 - □ TX10.2 Reasoning and Acting
 - └ TX10.2.6 Fault Response

